LOWER NICOLET WEST FRONT RANGE LICHT
Neebish Island, between Lake Nicolet and
Lake Munuscong
Barbeau Vicinity
Chippewa County
Michigan

HAER No. MI-68

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
Northeast Region
U.S. Custom House
200 Chestnut Street
Philadelphia, PA 19106

HISTORIC AMERICAN ENGINEERING RECORD

LOWER NICOLET WEST FRONT RANGE LIGHT HAER No. MI-68

Location:	Neebish Island between Lake Nicolet and Lake Munuscong Barbeau vicinity Chippewa County, Michigan Universal Transverse Mercator: 16.717350.5133760 USGS Quadrant: Oak Ridge
Dates of Construction:	Erected on present site 1931; originally built at Windmill Point, Detroit, Michigan, 1907; enlarged 1919 and moved to present site 1931
Present Owner:	United States Coast Guard
Present Occupant:	Unmanned
Present Use:	Range light for ships on St. Mary's River at Lake Nicolet
Significance:	The tower is a fine example of the use of steel-plate cylindrical towers aiding navigation on the St. Mary's River. Such towers have otherwise been replaced by modern steel skeleton towers.
Project Information:	Report prepared September 1993 by Massey Maxwell Associates, Historic Preservation Consultants, Strasburg, Virginia 22657, as mitigative documentation prior to demolition of the tower in accordance with a Memorandum of Agreement among the United States Coast Guard, the Michigan Historical Center, and the Advisory Council on Historic Preservation. James C. Massey, Architectural Historian Shirley Maxwell, Historian Jack E. Boucher, Photographer

In 1931, in order to accommodate the increasing number of larger ore ships plying the shallow waters of Lake Nicolet and the St. Nary's River en route to and from the Soo Locks at Sault Ste. Marie, the U. S. Corps of Engineers undertook a large-scale dredging project to revise the channel system around the St. Mary's River islands.[1] The channels served by lights at the Lower Nicolet Cut in the St. Mary's River were among those selected to be widened and deepened, and corresponding changes and additions to aids to navigation in the area were planned. Among those to be undertaken on Neebish Island, a double system of front and rear range lights for the east and west channels were needed, in addition to many changes in the buoy system.

As financial constraints had been further tightened by the Depression, it was decided to alter and reuse two cylindrical, steel-plate towers (originally constructed in 1907) that were no longer needed at the discontinued Windmill Point site in Detroit, rather than to build new skeleton towers from more recent designs.[2] The towers were to be erected on approximately 12.65 acres of land, some of which, as it turned out, could be acquired only through condemnation, a process that delayed the proposed construction by several months.[3] The towers were well underway

[1] Charles A. Park, Superintendent of Lighthouses, to Commissioner of Lighthouse, suggesting diversion of $10,000 in funds from those financing the Corps of Engineers dredging project ("which work, it is understood, is being carried out under the emergency appropriations of Congress for the relief of unemployment") to further the St. Mary's River project.

[2] A new tower design was approved by the Bureau for use as a front range light tower at Harwood Point and Dark Hole. See "Specifications for Lower Lake Nicolet Cut Range Lights 10 & 11, and Middle Neebish Cut South Range Lights Nos. 7 and 9," Feb. 18, 1930, and "Estimate of Cost of Proposed Works, St. Marys River Lights, New structures and alterations to existing structures," Feb. 13, 1930, which gives the cost of moving and reinstalling the Windmill Point towers as $2,400 for the front structure and $3,600 for the rear one. A new 25-foot tower proposed for Middle Neebish is estimated at a cost of $11,200, including the construction of a crib and concrete pier.

[3] The land purchase was apparently completed July 22, 1931, following a condemnation award on June 2, 1931. National Archives, Lighthouse Site Files, Michigan, Lower Lake Nicolet Cut. Box 106, Entry 66. Letter of Dec. 10, 1931 from the Attorney General to the Secretary of Commerce, noting condemnation of 8.6 acres, part of Lot 6, Section e, Township 45 North, Range 2 East, Neebish Island,

by the end of Fiscal Year 1931, according to the Annual Report of the Commissioner of Lighthouses, which noted that, "Lower Nicolet West Range Lights have been started and the concrete bases finished, temporary structures having been erected to serve in the meantime. [4]Erection of the steel superstructure is now in progress. . ."

The annual report for 1932 announced that, "Harwood Point West Range, Dark Hole West Range, Lower Nicolet West Range, and Middle Neebish Cut South Range have been constructed. Harwood Point, Lower Nicolet, and Dark Hole East have been rebuilt."[5]

Although all four lights remained in operation throughout the next 60 years, the cylindrical steel tower at Lower Nicolet West Rear Range Light (No. 11W) had been moved to a site 2,000 feet further back and replaced by a steel skeleton tower by 1958. The West Front Range Light No. 10 was thus the sole remaining example of the 1907 cylindrical steel construction on the site. In 1993, it was scheduled for demolition and replacement.

Description of Site

The Lower Nicolet West Front Range Light is on the north end of Neebish Island on St. Mary's River, at the confluence of Lake Nicolet and Middle Neebish Channel, 2.9 miles northeast of Oak Ridge, the only settlement on the island. The range light is located only slightly above the water level in a marshy area on the north shore of Neebish Island on the St. Mary's River at the confluence of Lake Nicolet and the Middle Neebish Channel. It is one of four range lights at this site, designated as the Lower Nicolet Range Lights, East Front (10E) and Rear (11E) and West Front (10W) and Rear (11W). The West Front tower is the only one surviving of the two historic, cylindrical steel-plate beacon towers that were erected on the West Front and Rear sites in 1931. The three other towers now on the sites are modern steel skeleton towers.

Sault Ste. Marie Township, Chippewa County, Michigan, as "sites for certain lighthouses and light stations on St. Mary's Island for award of $150.00."

[4]Annual Report, Fiscal Year 1931, page 24.

[5]Annual Report, Fiscal Year 1932, p. 20.

The ground rises gently from the marshy lake front to the rear towers. The area of the four beacon towers is cleared scrub, the surrounding area a mixture of scrub and mature trees. It is an isolated, unoccupied area with no road access. There are the remains of a concrete dock, 630 feet long, extending over marsh and open water and ending adjacent to the front west light. The east and west range lights are 200 feet apart, the east rear range light is 1,758.8 feet behind the front east light; the rear west range light was originally the same distance to the rear but was later moved 2000 feet farther to the rear. The four lights face northwest at N 29° 41'46" W into lake Nicolet. The U. S. Coast Guard site contains approximately 17 acres.

Description of Structure

The Lower Nicolet West Front Range Light No. 10W is a 50-foot steel cylindrical tower originally constructed in 1907 at Windmill Point, Detroit, Michigan, on the Detroit River at its confluence with Lake Sinclair. It was built to a Light House Bureau design of 1906. Constructed in two sections, the main part of the structure is an inward-sloping cylinder, 35'-4" high; a straight cylinder section, 14'-8" high, was added to the top in 1919. With the addition, the tower totals 50' in height, measured from the top of the foundation to the focal plane of the lens.

This combined tower was moved to Neebish Island and erected on the site in 1931. At the time of the move the tower was modified to accommodate the use of an acetylene-gas lantern rather than the oil-fueled locomotive headlamp it had used at the Windmill Point site. The acetylene-gas light and steel tower required a minimum of maintenance, allowing the station to be unmanned, since the light could be served by a tender from which the acetylene-gas cylinders were replaced or recharged.

The tower has a diameter of 8'-0" at the base, measured to the rivet seams of the base steel angle, and 8'-9-1/2", measured to the outside of the steel angle base. The lower three sections of the cylinder slope inward. At the top of the first section the diameter is 6'-2"; at the top of the second 5'-1"; and at the top of the third, 4'-6". The top seven sections are referred to as straight, although the diameter drops from 4'-6" to 4'-0". On top, there is a 5'-0"-diameter lantern house with a conical roof, topped by a ventilator. A steel cavetto cornice of 4" radius supports the conical steel roof. At the apex is an 8" circular ventilator shaft, 6" high , originally capped by a sheet-metal ventilator. The opening is now plugged with wood. There is a roof hand rail of steel near the edge of the roof. The overall height of the tower is 55'-0" to the top of the cone,measured

from the top of the concrete foundation which is about 1'-0" high above the ground line. The cylinder sections are of steel plate; the lower three are 1/4" plate, while the remainder are 3/16" plate. The plates overlap 2" and are fastened with 1/2" rivets, installed 2-1/2" on center. The larger-diameter lantern house at the top has a projecting rectangular steel opening for a wooden, one-light single-sash window for the light. The steel projecting frame is 4'-4" high and 3'-8" wide; it projects 6".

At the base, there is a steel arch-head door, set in a projecting steel-plate arched frame. The door is of plate with plain steel hinges, 2'-2" wide. On the inside of the door is a framework of steel plates-- perimeter and three stiles-- all riveted to the door plate. There is a plain rimlock and knob, as well as a modern padlock. The door is 2'-9" wide and 6'-9-3/8" high, closing on the outside of the steel door frame. A maker's plate on the door reads: "Made by/ Whitehead and Hales/ Ironworks,/ Detroit, Mich."

There is a low concrete threshold. There are two steel ventilators: one on the left door projecting jamb, comprising an inner plate with circular holes, sliding against a similar fixed plate. This opens and closes the ventilation holes. An exterior hood of steel projects 2", with overall dimensions of 10-1/2" X 12-1/2" . The second ventilator, similar in construction, is at the top front of the tower shaft, below the lantern house.

The octagonal base and foundation are of mass, unreinforced concrete with perimeter footings 5'-6" below grade and 12" above grade. A concrete slab floor is between the footings. The octagon-shaped base is 5'-0" on a side, for an overall maximum width of 12'-0". The tower is fixed to the base with a perimeter 4-1/2" X 4-1/2" steel angle with 1-1/4" bolts cast deep into the concrete foundation. On the northwest front there is a step down from the sloping top face of the base to the grade.

In 1975 a daymark was added to the northwest face of the tower perpendicular to the direction of the light beacon. The daymark is 12'-0" wide X 24'-0" and is fastened to the tower by a steel-angle structure. The daymark itself is on a 2" X 4" wood frame mounted on the skeleton structure; the solid face is in 3/4" plywood. The daymark consists of three broad vertical stripes of equal width: a center white stripe with a red stripe at each side.

On the interior, the base floor is concrete. Access is by the steel arch door described above. On each side is a steel rack that formerly held four accumulator tanks each for the 1931 acetylene gas light installed when the tower was moved to this

location. An electrical cabinet is now mounted on the left rack. In the center of the tower is a 16"-wide vertical steel ladder rising to the lantern-house floor at the top of the tower. At the base of the lantern house on top of the tower is a steel-plate floor with a hatch opening for the ladder. The hatch was formerly closed by a hinged floor plate, but the loose hatch is now at ground level. The lantern house, 5'-0" in diameter, has a projecting steel window frame on the northwest holding a wood-sash, single-light window, 33-1/2" X 42-0", for the range light. At the top of the conical roof over the lantern house is a ventilator shaft which was formerly topped by a ventilator housing.

The present range light is electric, mounted on a steel platform, with an electric panel box mounted on the adjoining wall. Although there is no legible date on available copies of the drawings for the change to electricity from acetylene gas, other drawings indicate that the date of installation was 1958 or earlier. The present light is fixed and provides 20,000 candlepower. The acetylene lamp and flasher installed in the 1931 move to this location had an 18" concave Mangin mirror copper-sheathed on the rear and mounted on a brass frame with piping to the grade level tanks. It was removed when the electric light was installed. The original (1907) light, which was not brought to this site from Windmill Point, was a locomotive headlight, oil fueled, mounted in a metal frame with a wood platform. It was hung by rope via pulleys mounted on the roof for servicing and was raised by a hand winch mounted on a wood frame at ground level. No trace of this lighting system remains.

Five feet-four inches east of the tower base is a 3'-0" wide reinforced pier walkway and railway, which begins at the side of the tower and extends 630' through marsh to open water. Much of the walkway has collapsed. At the end of the walkway are remnants of the 24"-gauge railway used to transport accumulator tanks and equipment from boats at the dock. The walkway and dock were completed in 1933. The concrete pier walkway is 6" thick; its piers are 11-1/2" thick, spaced at 10'-0" on center. The structure starts by the tower at grade; at its dock end on the lake it was 4'-0" above LWD. The dock end of the walkway was 6' wide and extended 11' landward. It has now collapsed.

The exterior of the beacon tower is painted bright red and the interior white with a black wainscot. These appear from visual inspection of samples to be the original colors, at least on this site. No other colors remain on the steel work.

The tower shows extensive rust and is, overall, in a poor and deteriorated condition.

List of Sources Consulted:

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Small, Nora Pat. "Lighthouses of the National Park Service, a Catalogue." Washington, D.C.: National Park Service, Division of Historical Architecture, 1983. Typescript.

U. S. Navy Department, Engineering Instructions, United States Coast Guard, Chapter 31: Lighted Aids to Navigation. Washington D. C.: U. S. Government Printing Office, 1944.

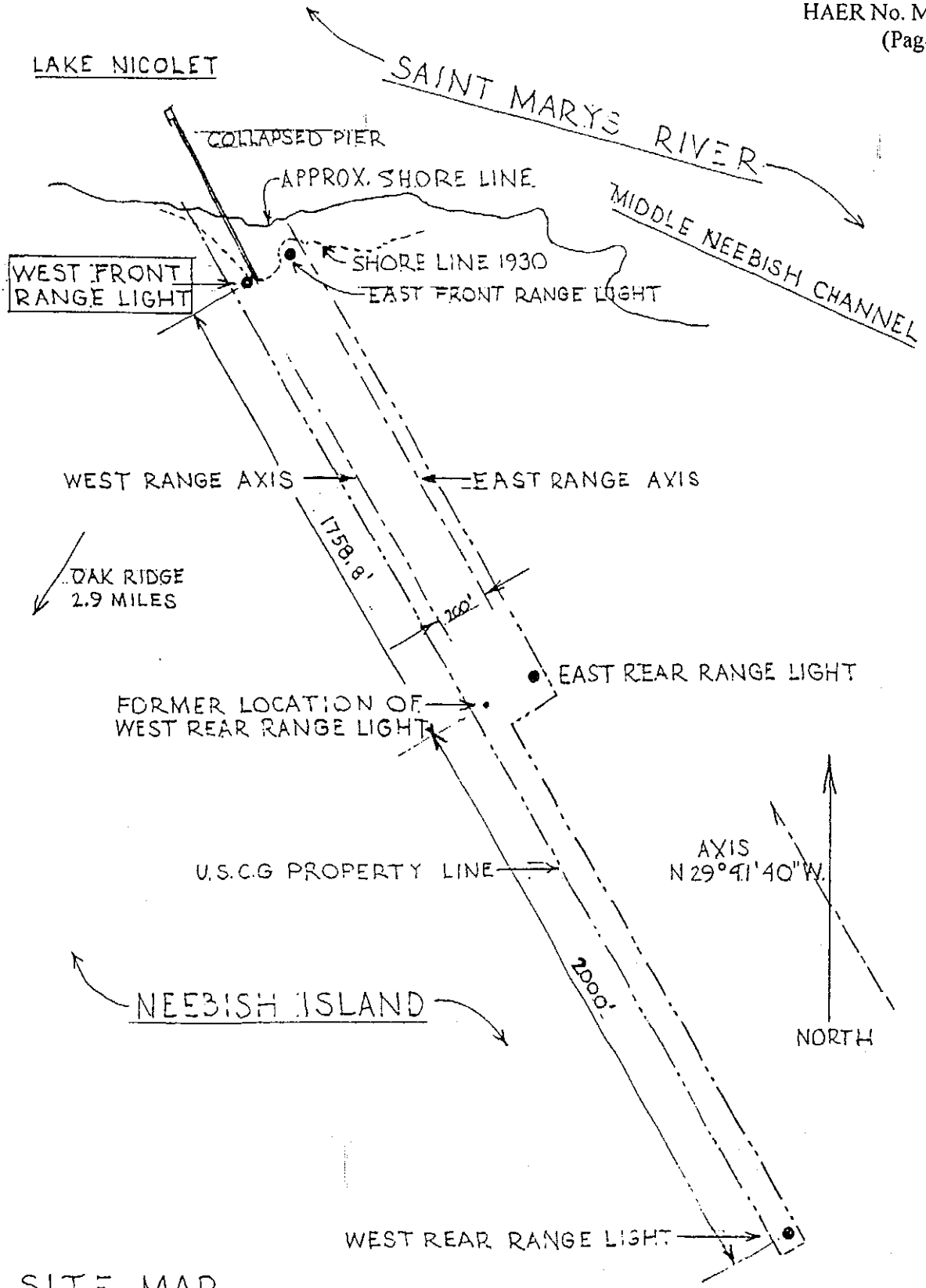
Copy in Cleveland Office, USCG.

Other Sources Consulted:

State Historic Preservation Office, Michigan Historical Center, Lansing, Michigan

Archives, Michigan Historical Center

Dawson Great Lakes Museum, Detroit, Michigan



SITE MAP

SCALE APPROX 1" = 500'

J. C. MASSEY 1993

February 18, 1930.

Form 300.

SPECIFICATIONS FOR

LOWER LAKE NICOLET CUT RANGE LIGHTS 10 & 11

AND MIDDLE NEEBISH CUT SOUTH RANGE LIGHTS NOS. 7 and 9.

See Drawings 11838, 11294, 11295, 11297, 11298, 11285, 11286.

1. Characteristic of Lights: It is proposed to have the right hand, ahead, set of range lights white, and the left hand set red in every case, as in the case of Harwood Point and Dark Hole Ranges, approved by the Bureau January 22, 1930. It is also proposed, to have all rear lights fixed and all front lights quick flashing 0.3 second light, 0.7 second eclipse.

2. Lower Lake Nicolet Cut East Range Lights, 10E & 11E: The present range light structures are 51 ft. steel towers equipped with slatted daymarks, oil lamps and a hoisting arrangement for servicing the lamps. It is proposed to alter both of these towers by providing a flat plate top suitable for receiving a lantern, and building a platform with railing, at the top of the towers. Each tower will also be equipped with a steel tank shelter mounted at the base. Proposed changes to towers are shown on drawing No. 11295. The tankhouse will be identical with those to be used at the rear lights at Harwood Point and Dark Hole Ranges. It is planned to use the Interflash Signal Corporation type LR-400 acetylene range lantern with doublet lens and 1/4 cu. ft. burner, giving a candlepower of about 3200 and a divergence of about 9 degrees.

3. Lower Lake Nicolet Cut West Range Lights 10W & 11W: There are now on hand the two cylindrical range towers, 50 ft. and 70 ft. front and rear, respectively, from the discontinued Windmill Point Range, and it is planned to reuse these towers here after making the following alterations: providing acetylene tank racks at the base, a floor in the lantern, ventilators, and cutting an 18" x 18" door in the rear side of the rear tower lantern to be used as a means of servicing the sunvalve. Each tower will be mounted on a mild concrete foundation. The contour map, drawing No. 11294, shows the locations for these lights, and drawing No. 11298 shows the alterations necessary to the towers. It is proposed to utilize for these lights 18" Mangin mirror reflectors, mounting same in a cast brass pedestal, both of which are on hand and may be assembled at a considerable saving over the cost of range lanterns. The reflector assembly will be mounted on a suitable pedestal and fitted with a 1/4 cu. ft. acetylene burner. A 1/4 cu. ft. burner placed at the focus would give a candlepower of about (8500) however, the divergence would be very slight. It is therefore proposed to place the burner at the front range light approximately 3/4" beyond the exact focus of the reflector, thus increasing the divergence where it is most needed, and decreasing the candlepower to about 2500, and placing the burner at the rear range light 3/8" beyond the exact focus, producing about one-half the divergence and a candlepower of approximately 5500. The burners for these lights will not be enclosed except in the lantern of the tower. See drawing No. 11298 for details of above equipment.

4. Middle Neebish Cut South Range Front Light No. 7: It is planned to use here the 25 ft. steel tower recently designed in this office, using the Bureau of Standards design as a model except to place steel plating on the adjacent sides to serve as a daymark, and orienting the tower diagonally with the range so that both sides will be visable from the channel. This tower has been approved by the Bureau for use as front range light towers at Harwood Point and Dark Hole Ranges. It has

(continued)

...ly been planned to use the tower and lighting equipment here from the present Meebish Cut Front Range Light No. 7. However, since the adaption of the ...ystem of ranges in this channel, the present light will remain unaltered except ...nge its name and characteristic. The tower will be mounted on a concrete pier ...t. square, approved by the Bureau August 20, 1929. The details of the tower and ... are shown on drawings 11295, 11296 and 11238. The lighting equipment used here ...ll be the same as that used at Lower Lake Nicolet Cut East Range Lights.

5. Middle Meebish Cut South Range Rear Light No. 9: This light will be located at the intersection of Middle Meebish Cut South range and the upper cut of the down-bound West Meebish Channel, produced. This tower thus serves for both channels. It has been previously proposed (see Form 80 from this office dated August 12, 1929) to use an 85 ft. tower with a daymark on three sides. It is now considered that a 60 ft. tower with a daymark on three sides as the one above, and with a tankhouse at the base will be of sufficient height and cost considerable less, and it is therefore recommended that this change be allowed. Such a tower is being designed with a daymark six panels in length. This tower will conform as to panel heights, overall dimensions, etc., with the Bureau's Standards designs, except to be slightly more rigid in order to provide for the additional wind resistance created by the increased size of the daymark. Drawing 11297 shows the arrangement of the tower and the details of the pier which has been slightly altered in design because of the change in towers from that approved by the Bureau for this light. The lighting equipment here will be identical with that used at the front range, except that there will be two range lanterns.

6. All structures on the right hand range (with white lights) will be painted white, and those on the left hand range (with red lights) will be painted red. This is in line with the painting scheme for the other lights in this project.

7. All lights burning fixed will be equipped with a sun valve in order to conserve acetylene.

8. Lower Lake Nicolet Cut East Range Front Light No. 10 will be flashing red every second, light 0.3 second, eclipse 0.7 second, candlepower 1000, 55 ft. above water on a red square pyramidal tower 51 ft. high with a white vertically slatted daymark.

9. Lower Lake Nicolet Cut East Range Rear Light No. 11 will be fixed red, 1000 candlepower, 77 ft. above water on a red square pyramidal tower, 51 ft. high with vertically slatted daymark.

10. Lower Lake Nicolet Cut West Range Front Light No. 10 will be flashing white every second, light 0.3 second, eclipse 0.7 second, candlepower 2500, 55 ft. above water, enclosed in the lantern of a cylindrical tower 50 ft. high (towers from Windmill Point) and located 200 ft. 240° from Lower Lake Nicolet Cut East Range Front Light.

11. Lower Lake Nicolet Cut West Range Rear Light No. 11 will be fixed white, 5500 candlepower, 96 ft. above water, in a cylindrical tower 70 ft. high located 200 ft. 240° from Lower Lake Nicolet Cut East Range Rear Light.

12. Middle Neebish Channel North Range Front Light No. 7 will be flashing every second, light 0.3 second, eclipse 0.7 second, candlepower 500, 31 ft. water on a white pyramidal steel tower 25 ft. high with an oval slatted daymark and located on a concrete pier.

13. Middle Neebish Channel North Range Rear Light No. 9 will be fixed white candlepower, 46 ft. above water on a white pyramidal steel tower 40 ft. high with oval slatted daymark, and located on a concrete pier.

1500 candlepower.

14. Middle Neebish Channel South Range Front Light No. 75 will be flashing every second, light 0.3 second, eclipse 0.7 second, candlepower 1000, 35 ft. above water on a red pyramidal steel tower 25 ft. high, enclosed the entire height on the channel side and located on a concrete pier. It will be located 240 ft. 161° from Middle Neebish Channel North Range Front Light No. 7.

15. Middle Neebish Channel South Range Rear Light No. 95 will be fixed red, candlepower 1000, 69 ft. above water on a red pyramidal steel tower 60 ft. high with a tankhouse at the base placed diagonally with the channel, having a daymark 34 ft. high, and located on a concrete pier. It will be located 3300 ft. 290° from Middle Neebish Channel North Range Light No. 9. Upper Neebish Upper Cut Loading Light will be fixed white, 3600 candlepower, on the same structure as Middle Neebish Channel South Range Rear Light No. 95.

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WORKS

DEPARTMENT OF COMMERCE
LIGHTHOUSE SERVICE

117

Aid: ST. MARYS RIVER LIGHTS

OFFICE OF SUPERINTENDENT OF LIGHTHOUSES 11th DIST.

Proposed Work: New structures. Detroit, Michigan, February 13, 1930

ITEMS, QUANTITIES, AND UNIT PRICES	AMOUNT
MIDDLE NEEBISH CUT SOUTH FRONT RANGE LIGHT NO. 7:	
Twenty-five foot Tower:	
Steel for tower, 6000 lbs. @ 3½¢,	$ 210.00
Labor, fabrication, 6000 lbs. @ 5¢,	300.00
Range lantern with flasher,	400.00
Acetylene piping including 6-hole manifold gauge, etc.,	35.00
Acetylene tanks, A-60, 6 @ $76,	456.00
Erecting tower, painting, etc.,	80.00
Installing illuminating apparatus,	30.00
Crib and concrete pier in place complete (See estimate Form 80 dated August 12, 1929),	9,500.00
Contingencies	[illegible]
Total,	$11,800.00
MIDDLE NEEBISH CUT SOUTH REAR RANGE LIGHT NO. 9:	
Sixty-foot Tower, daymark on three sides:	
Steel for tower and tankhouse, 19,500 lbs. @ 3½¢,	682.50
Labor, fabricating steel, 19,500 lbs. @ 5¢,	1,975.00
Two range lanterns with regulator, sun valves, brackets, etc.,	800.00
Acetylene piping, fittings, 8-hole manifold gauge, etc.,	60.00
Acetylene tanks, A-60, 15 @ $76,	1,140.00
Labor, erecting tower, painting, etc.,	250.00
Installing illuminating apparatus,	50.00
Crib, concrete pier in place complete, etc., (See estimate Form 80 dated August 12, 1929),	7,150.00
Miscellaneous and contingencies,	[illegible]
Total,	$11,500.00
Total for range,	$22,700.00

Estimate prepared by W. R. Bellamy

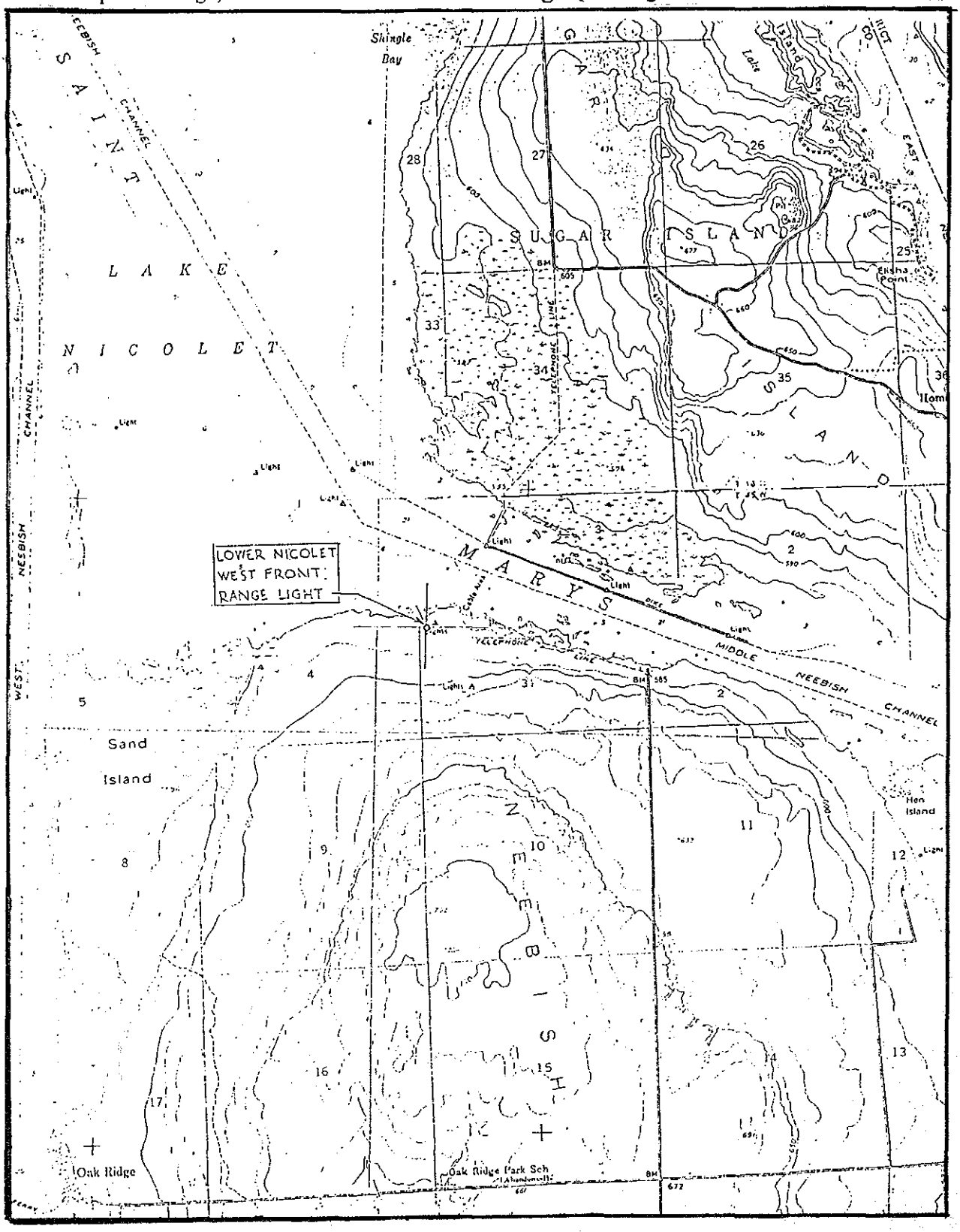
ST. MARYS RIVER LIGHTS — OFFICE OF SUPERINTENDENT OF LIGHTHOUSES — 11th DIST.

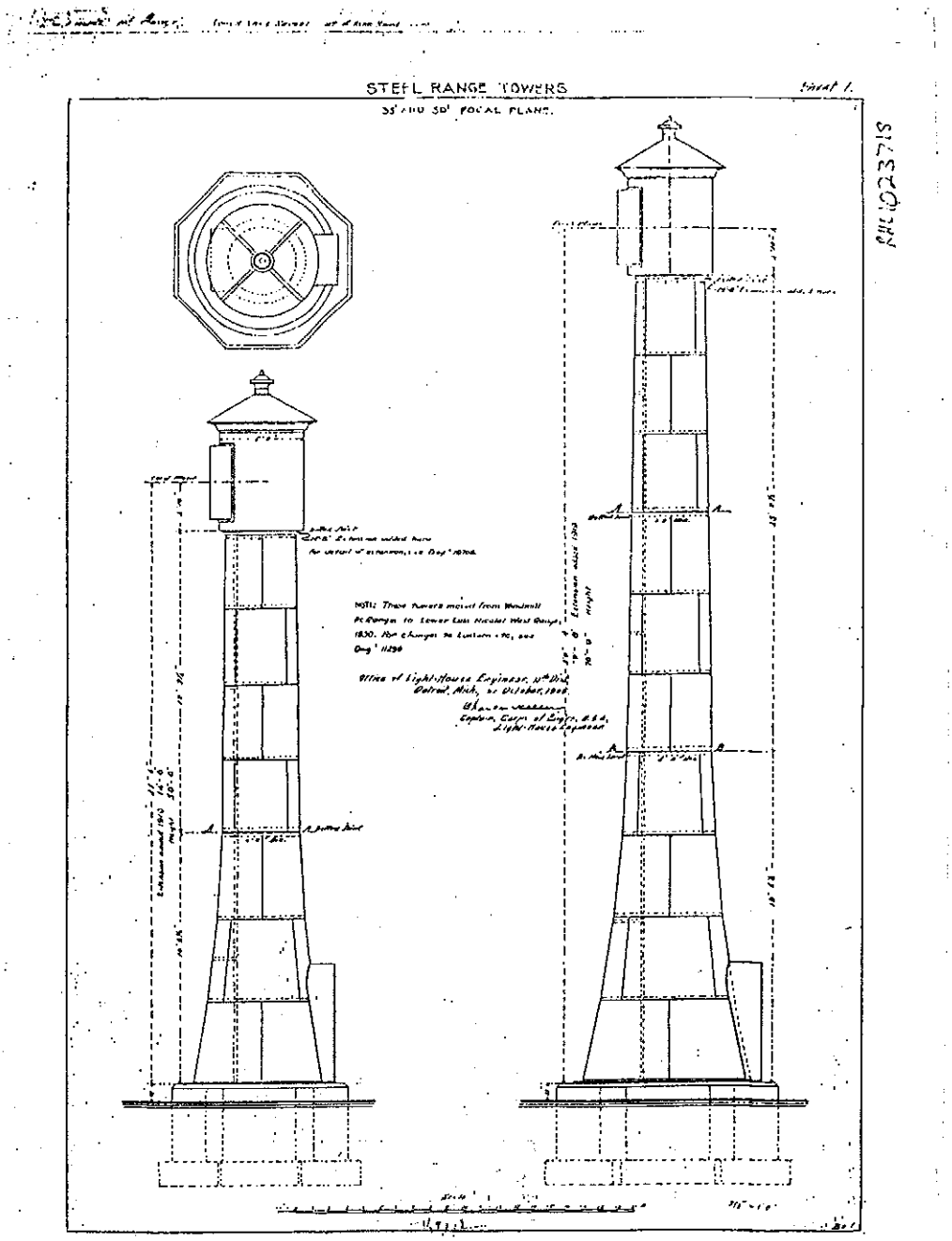
Work: New structures and alterations to existing structures. — Detroit, Michigan, February 15, 1930.

ITEMS, QUANTITIES, AND UNIT PRICES	AMOUNT
LOWER LAKE NICOLET CUT RANGE NOS. 10 & 11 Change to automatic and rayless structures.	
Front Range:	
Steel for platform and house, 2400 lbs. @ 3½¢,	$ 84.00
Fabricating steel, 2400 lbs. @ 6¢,	144.00
Pipe, rail, etc., fabricated,	30.00
Range lantern with flasher, acetylene piping, 6-hole manifold gauge, etc.,	450.00
Acetylene tanks, A-60, 6 @ $76,	456.00
Structural changes to tower and field, installing platform, rail, etc.	100.00
Installing tankhouse, concrete base, etc.,	50.00
Installing illuminating apparatus,	50.00
Miscellaneous and contingencies,	136.00
Total, 1	$1,500.00
Rear Range:	
Cost as above for front,	$1,500.00
Additional acetylene tanks, 3 @ $96,	288.00
Sun valve and additional piping,	72.00
Total,	$1,800.00
Total for present range,	$3,300.00

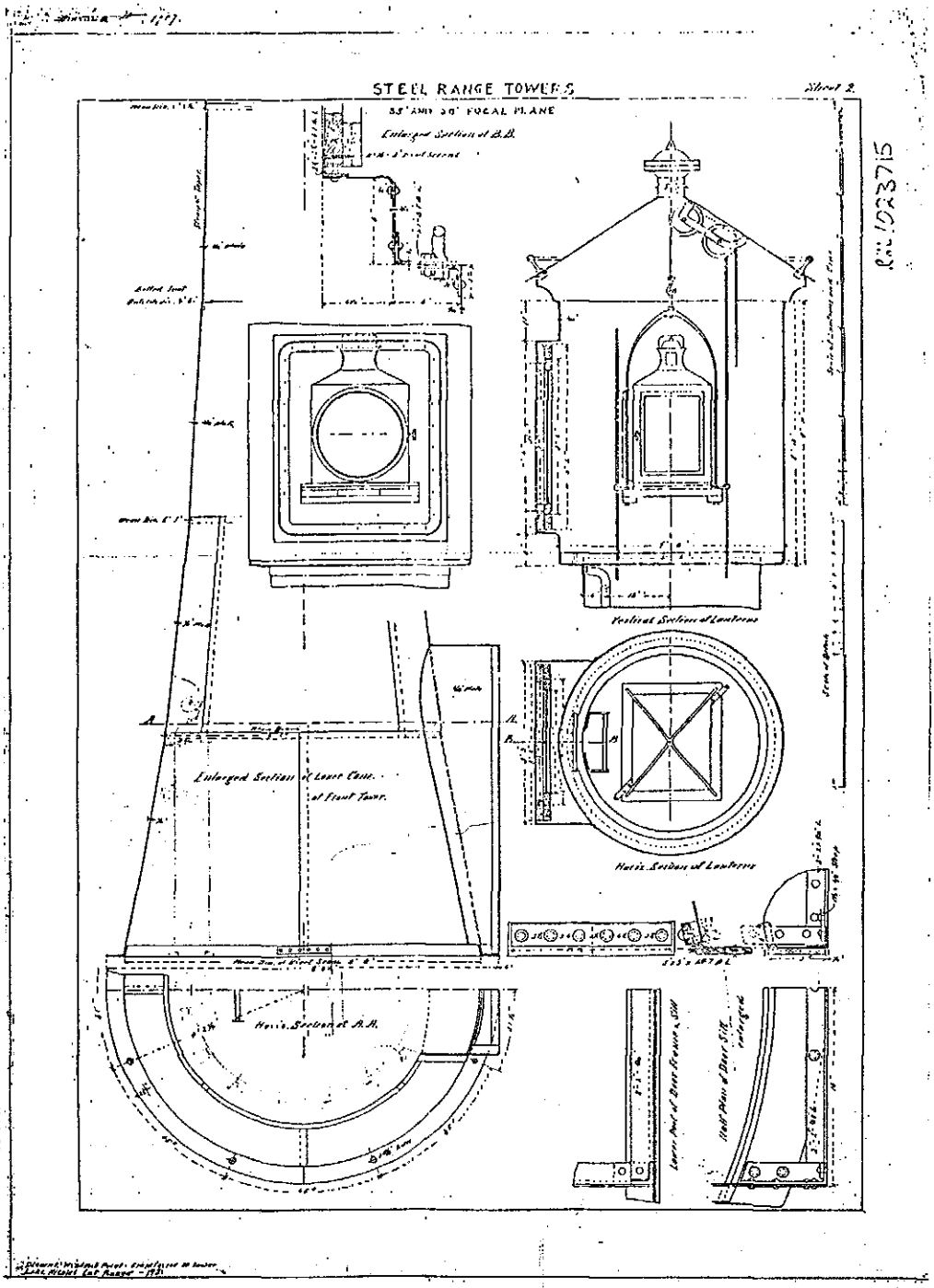
Estimate prepared by W.R.Bellamy

Location of Lower Nicolet West Front Range Light
Base Map: Oak Ridge, MI-Ont. 1:24000 – USGS Oak Ridge Quadrangle – 1976

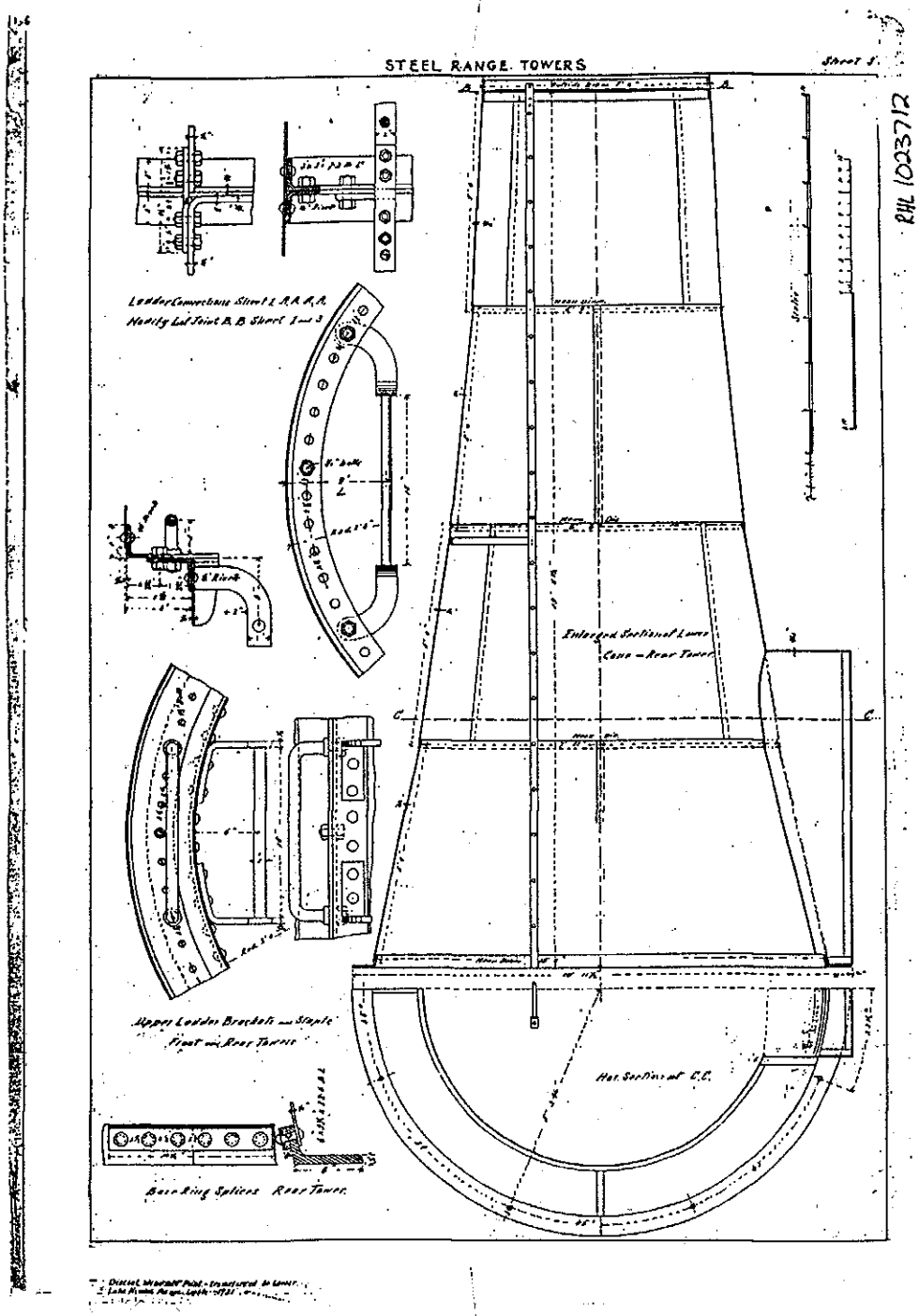




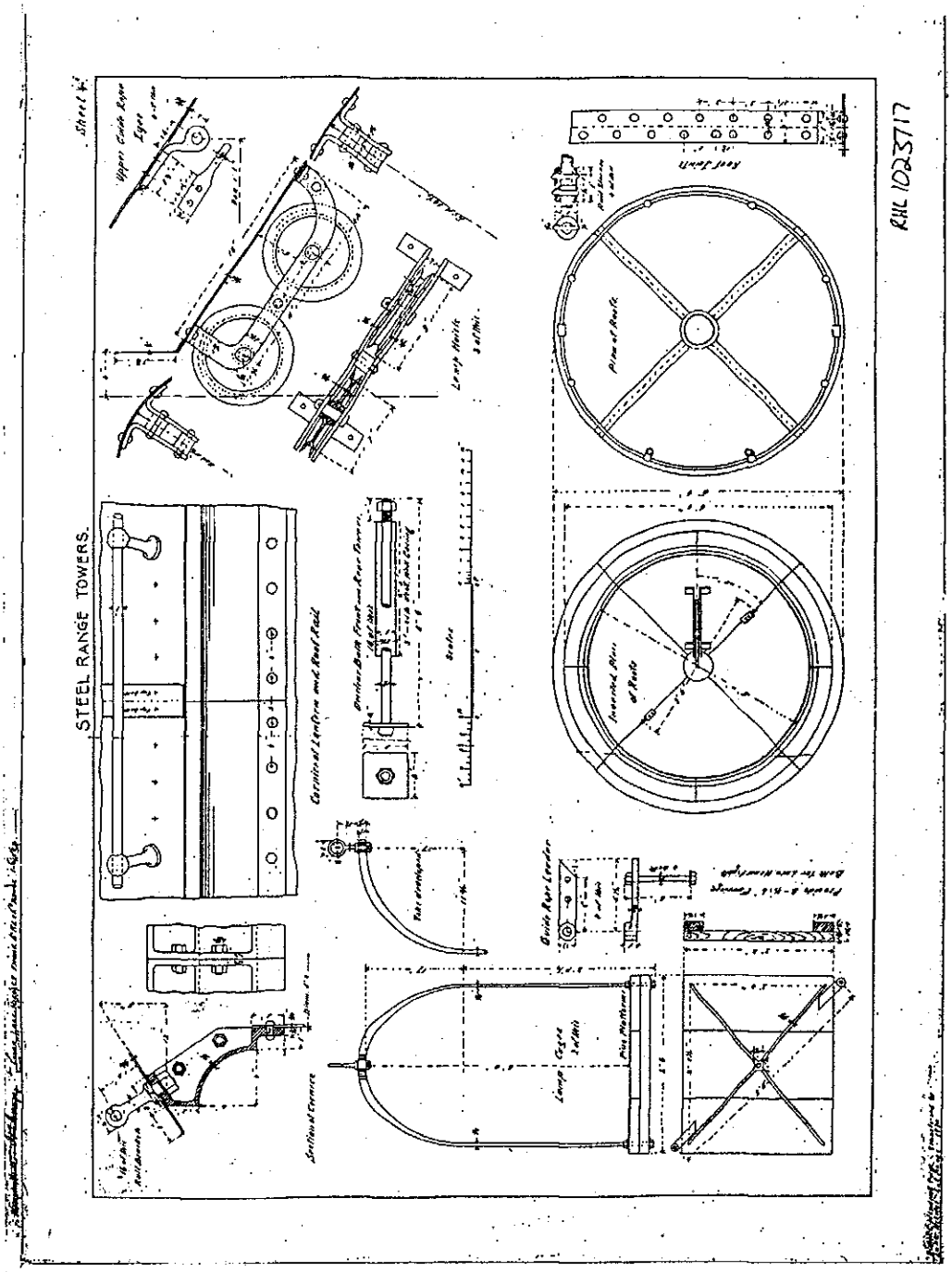
Xerox copy of Drawing No. RHL 1023718 (Old No.: Sheet 1 [of set of 51]). Office of Lighthouse Engineer, 11th District Detroit, Mich. Title: "Steel Range Towers." Date: 31 Oct. 1906. Signature: Charles Keller, Capt., Corps of Engineers, U.S.A., Lighthouse Engineer. Subject: Tower elevations [original tower as constructed]. Original drawing located at the National Archives, Cartographic Branch.



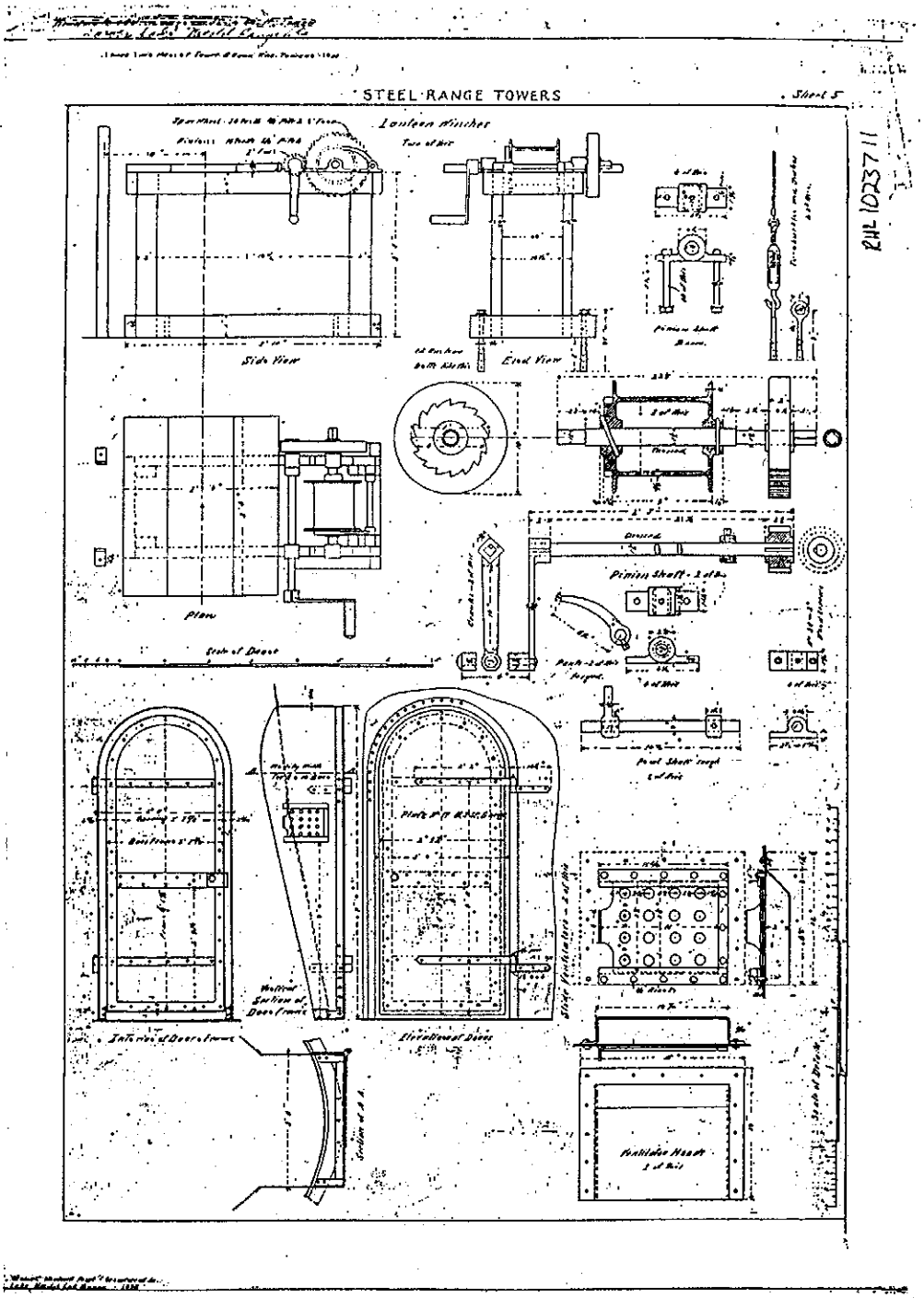
Xerox copy of Drawing No. RHL 1023715 (Old No. Sheet 2). Office of Lighthouse Engineer, 11th District Detroit, Mich. Title: "Steel Range Towers." Date: 1907. No signature. Subject: Tower and lantern details. Original drawing located at the National Archives, Cartographic Branch.



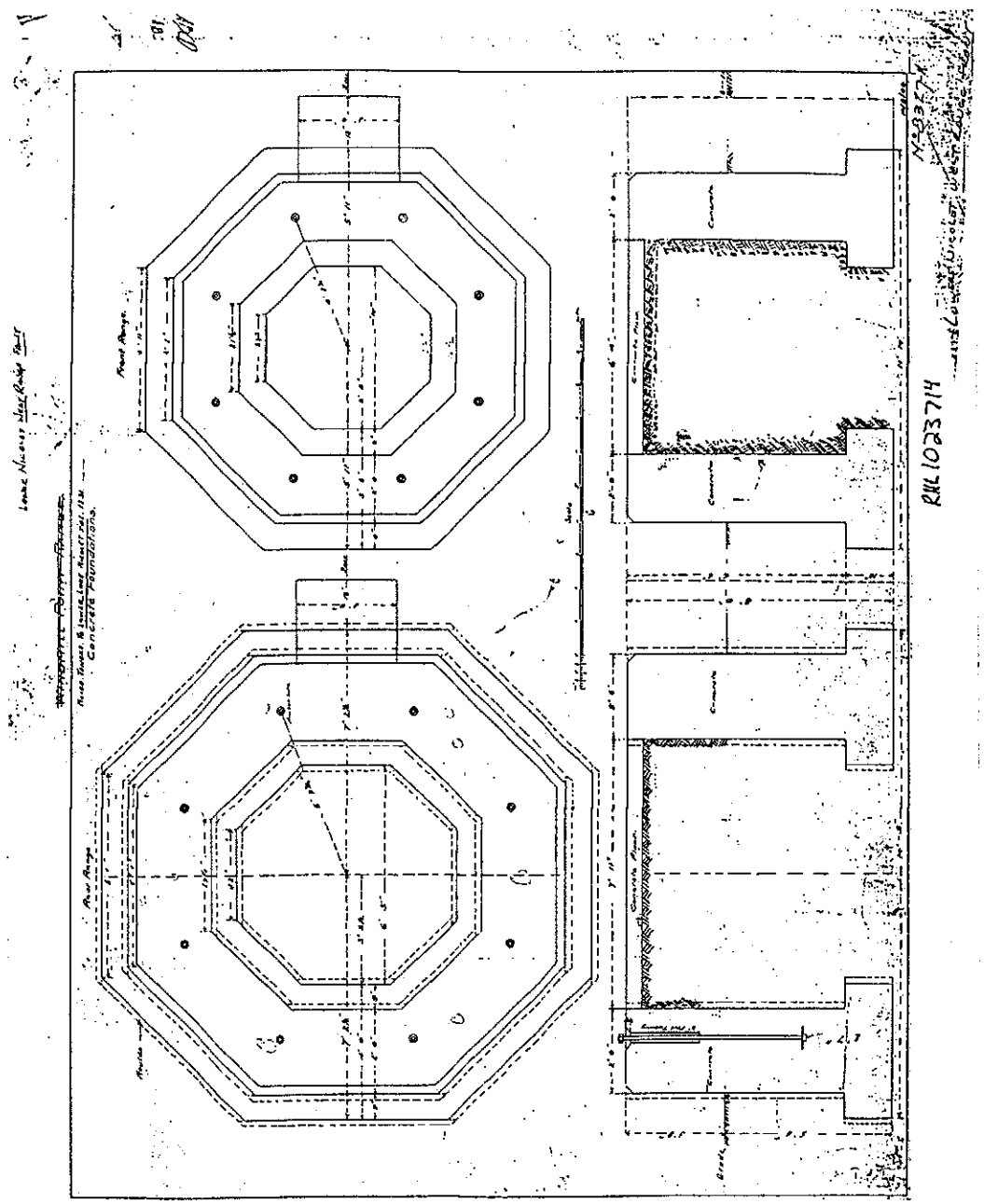
Xerox copy of Drawing No. RHL 1023712 (Old No.: Sheet 3). Office of Lighthouse Engineer, 11th District Detroit, Mich. Title: "Steel Range Towers." Date: none [1906]. Signature: none. Subject: Tower and ladder details. Original drawing located at the National Archives, Cartographic Branch.



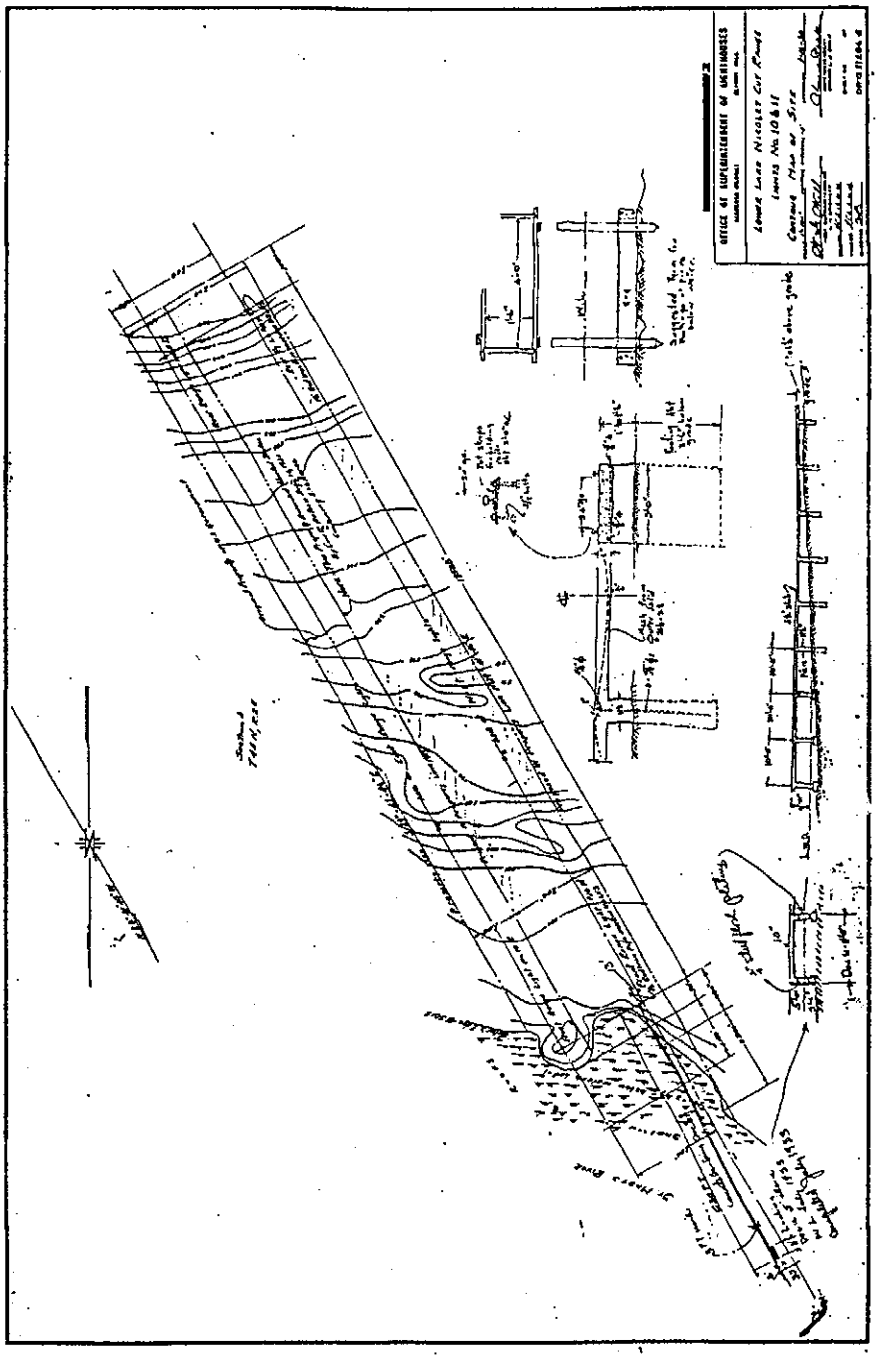
Xerox copy of Drawing No. RHL 1023117 (Old No.: Sheet 4). Office of Lighthouse Engineer, 11th District Detroit, Mich. Title: "Steel Range Towers." Date: none [1906]. Signature: none. Subject: Roof and lamp cage details. Original drawing located at the National Archives, Cartographic Branch.



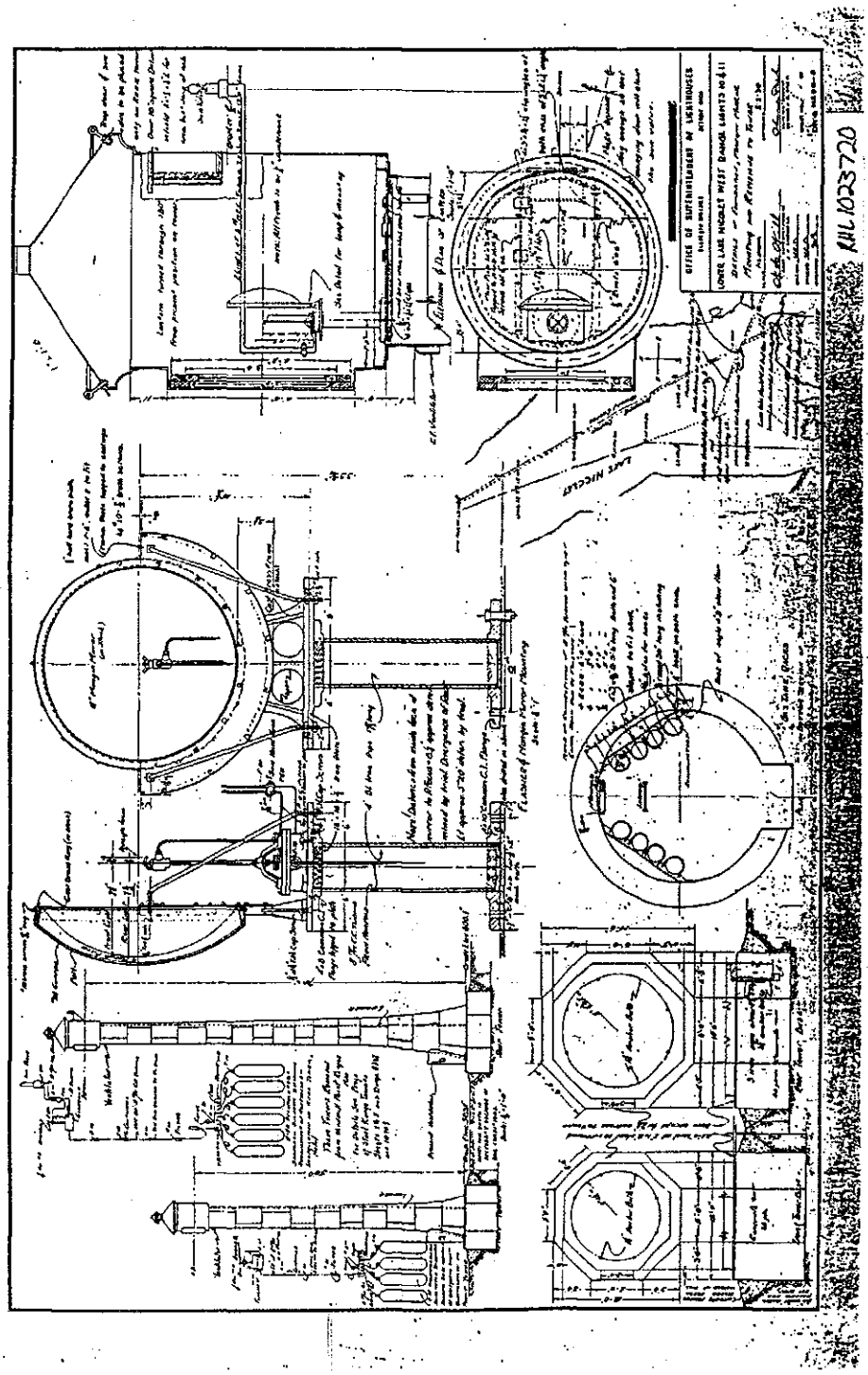
Xerox copy of Drawing No. RHL 1023711 (Old No.: Sheet 5). Office of Lighthouse Engineer, 11th District Detroit, Mich. Title: "Steel Range Towers." Date: none [1906]. Signature: none. Subject: Winch and door details. Original drawing located at the National Archives, Cartographic Branch.



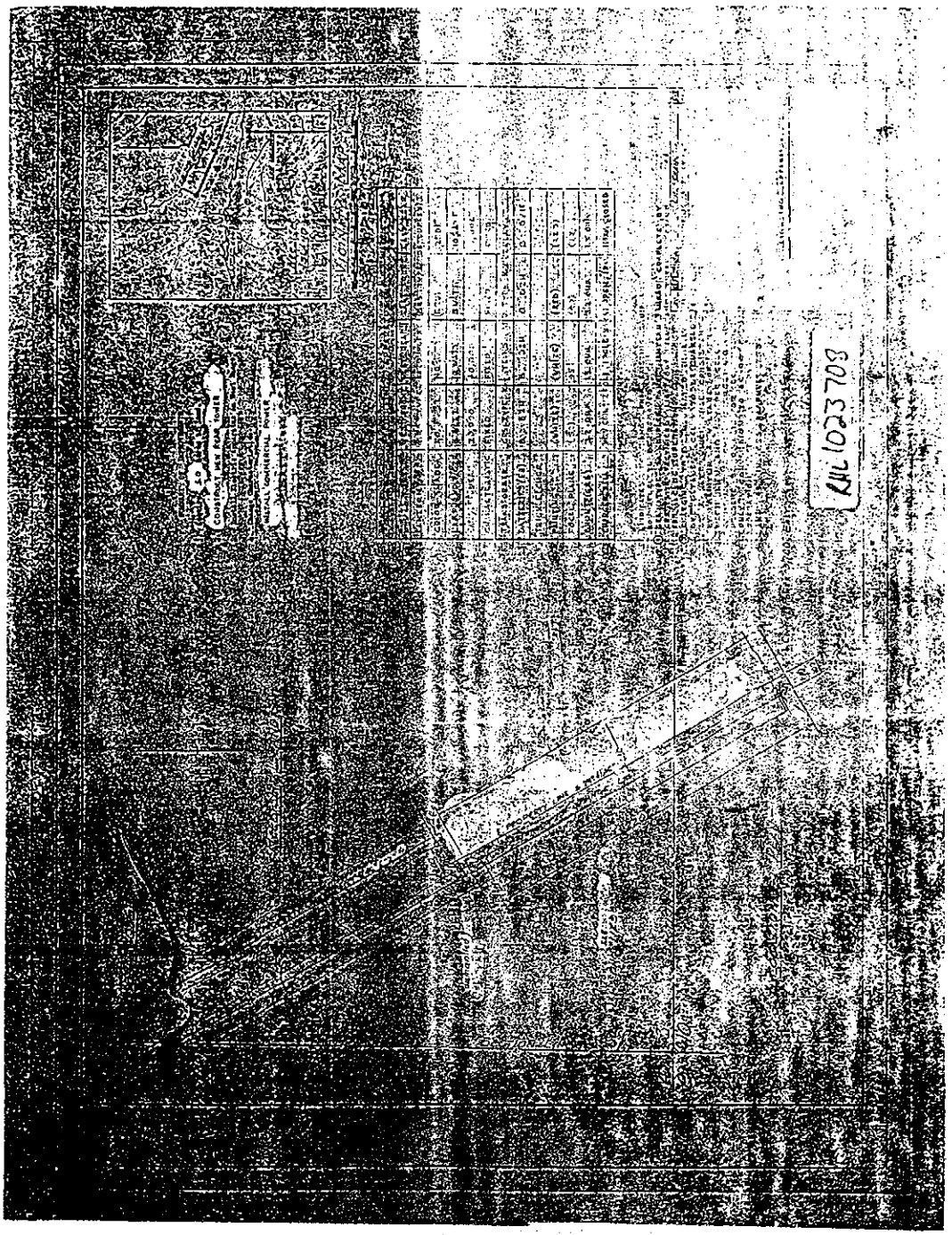
Xerox copy of Drawing No. RHL 1023714 (Old No.: 8327-H). Office: none [probably Office of Lighthouse Engineer, 11th District Detroit, Mich. Title: "Concrete Foundations." Date: 12/08/06. Signature: none. Subject: Base and foundations. Original drawing located at the National Archives, Cartographic Branch.



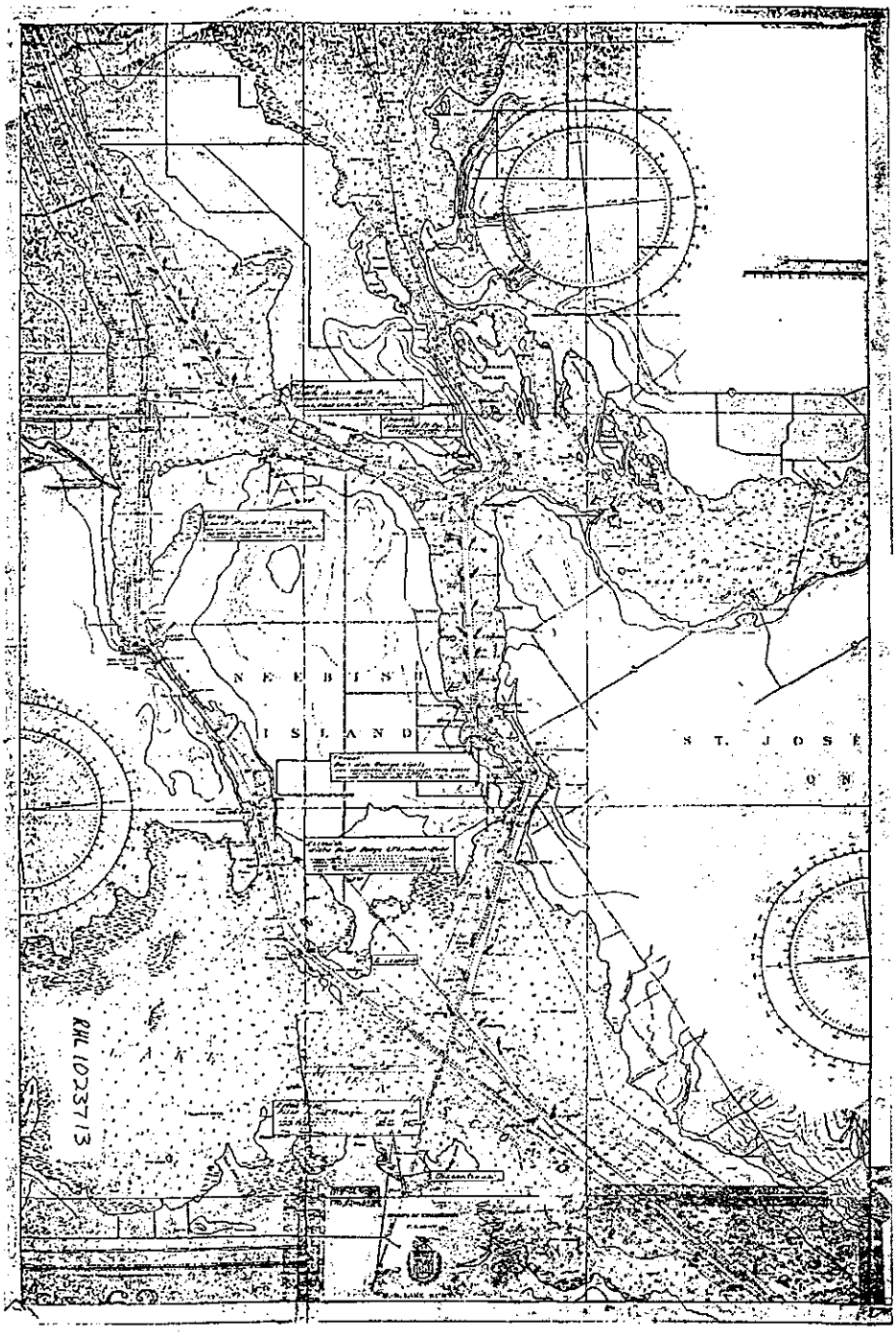
Xerox copy of Drawing No. RHL 1023719 (Old No.: 11294-S). Office: Office of Superintendent of Lighthouses, 11th District, Detroit, Mich. Title: "Lower Lake Nicolet Cut Range Lights No. 10 and 11, Contour Map of Site." Date: 1/16/30. Signature: Chas. Park [?], Superintendent, Senior L.H. Engr. Subject: Contour map of site with location of range lights and dock, with dock details. Original map located at the National Archives, Cartographic Branch.



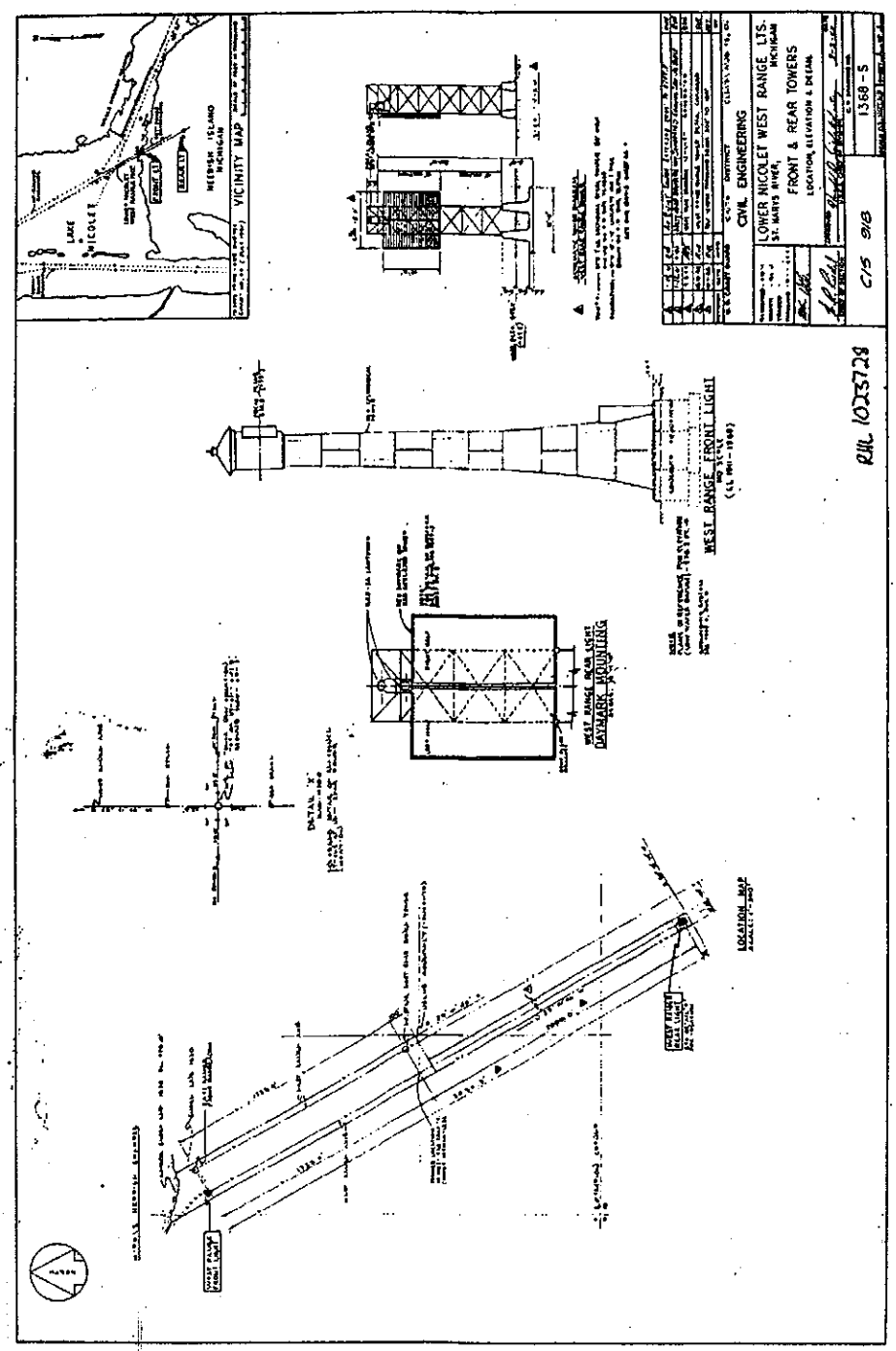
Xerox copy of Drawing No. RHL 1023720 (Old No.: 11295-S). Office: Office of Superintendent of Lighthouses, 11th District, Detroit, Mich. Title: "Lower Lake Nicolet West Range Lights No. 10 and 11; Details of Foundation, Mangin Mirror, Mounting and Revisions to Tower." Date: 2/3/30. Signature: Chas. Park [?], Senior L.H. Engr. Subject: Foundation, Mangin Mirror, Acetylene Light, and Tower Revisions. Original drawing located at the National Archives, Cartographic Branch.



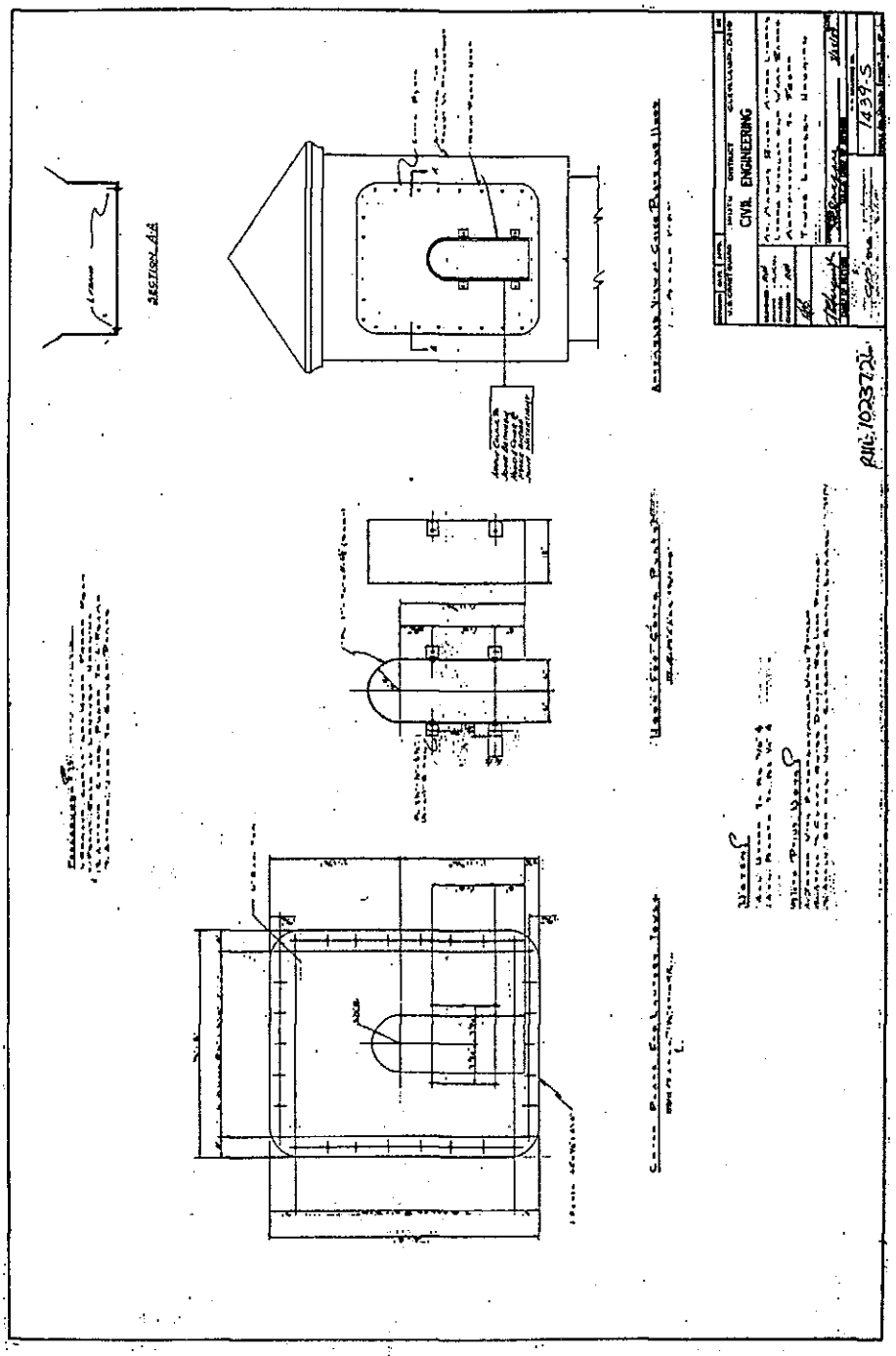
Xerox copy of Drawing No. RHL 1023708 (Old No.: not legible). Office: not legible. Title: "Location Plan." Date: not legible [ca. 1958]. Signature: not legible. Subject: Location plan and written summary of improvements and written schedule of lighting apparatus. Original drawing located at the National Archives, Cartographic Branch.



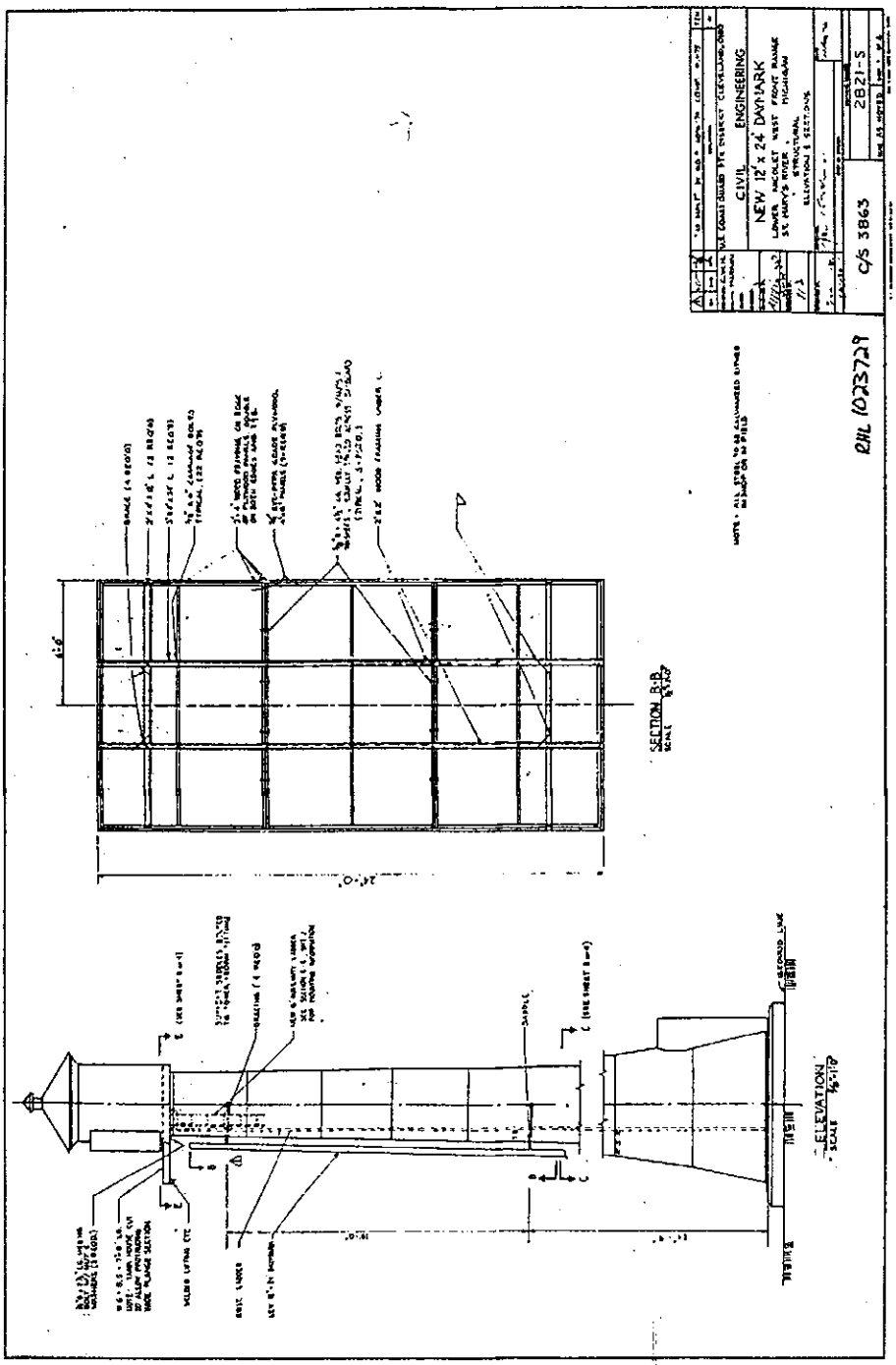
Xerox copy of Drawing No. RHL 1023713 (Old No.: not applicable). Office: Corps of Engineers, U.S. Army, U.S. Lake Survey. Title: not legible. Date: not legible [ca. 1958]. Signature: not applicable. Subject: Printed Corps of Engineers map of Neebish Island area, with manuscript annotations of work on several series of range lights. Original map located at the National Archives, Cartographic Branch.



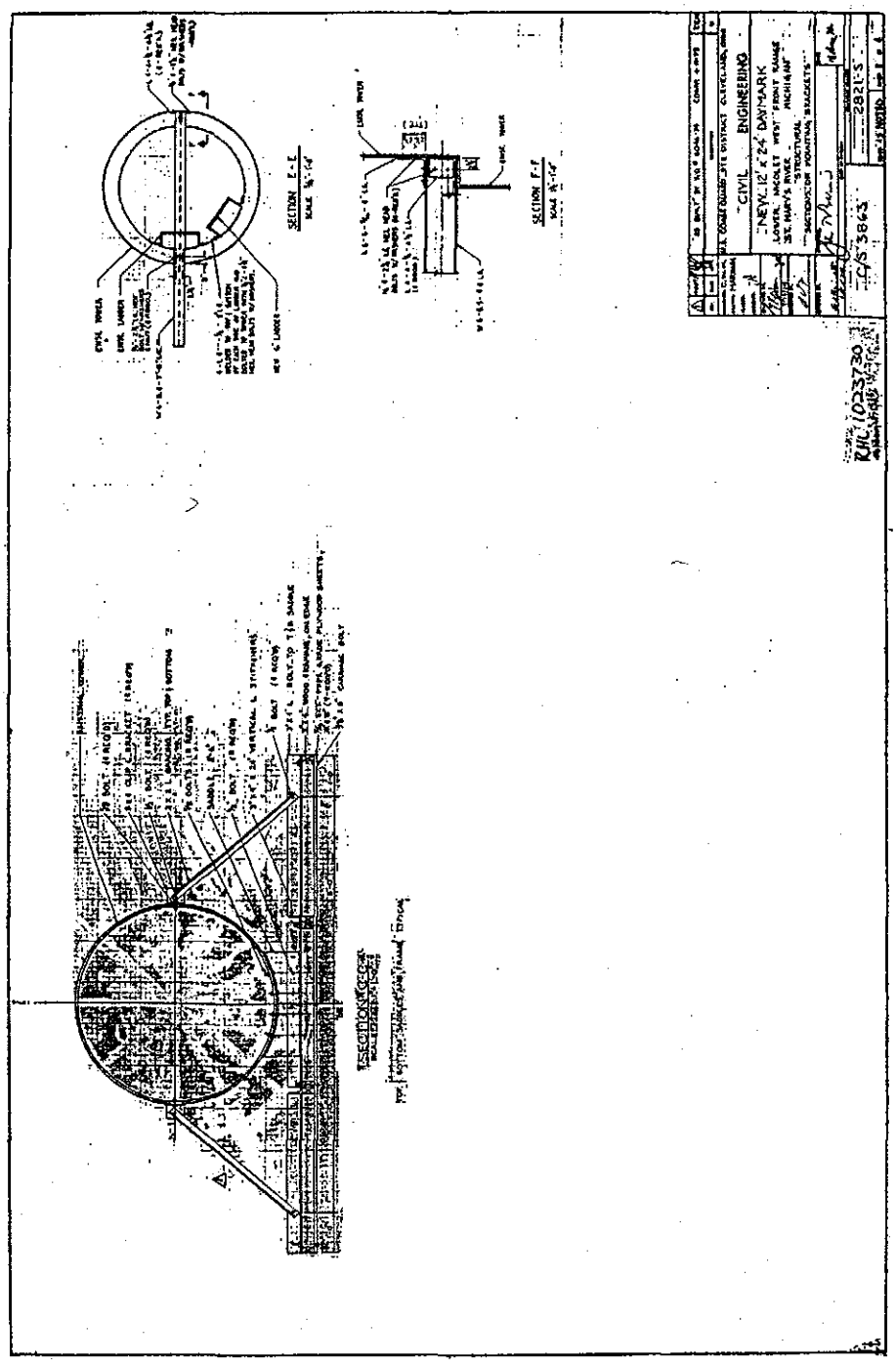
Xerox copy of Drawing No. RHL 1023728 (Old No.: 1368-S). Office: U.S. Coast Guard, 9th District, Cleveland 13, O. Civil Engineering. Title: "Lower Nicolet West Range Lts. Front and Rear Towers Location, Elevation and Detail." Date: 9/3/58. Signature: Harold D. [illegible], Acting USCG Chief of Division. Subject: Location, elevation, and detail. Original drawing located at the National Archives, Cartographic Branch.



Xerox copy of Drawing No. RHL 1023726 (Old No.: 1439-S). Office: U.S. Coast Guard, Cleveland, Ohio, Civil Engineering. Title: "St. Mary's River Minor Lights Lower Nicolet Cut West Range Modifications to Front Tower Lantern Housing." Date: 7/24/59. Signature: H. R. [illegible], USCG Chief of Division. Subject: Modification to front tower lantern housing [not executed]. Original drawing located at the National Archives, Cartographic Branch.



Xerox copy of Drawing No. RHL 1023729 (Old No.: 2821-S, Sheet 1 of 4). Office: U.S. Coast Guard 9th District, Cleveland, Ohio, Civil Engineering. Title: "New 12' x 24' Daymark, Lower Nicolet West Front Range Structural Elevation and Sections." Date: 14 April [?] 74. Signature: [illegible], Chief of Division. Subject: Daymark details. Original drawing located at the National Archives, Cartographic Branch.



Xerox copy of Drawing No. RHL 1023730 (Old No.: 2821-S, Sheet 2 of 4). Office: U.S. Coast Guard 9th District, Cleveland, Ohio, Civil Engineering. Title: "New 12' x 24' Daymark, Lower Nicolet West Front Range Structural Sections of Mounting Brackets." Date: 13 Apr [?] 74. Signature: John T. [illegible], Chief of Division. Subject: Details of mounting brackets for daymark. Original drawing located at the National Archives, Cartographic Branch.